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FLOOD INSURANCE STUDY

CITY OF WATERTOWN, NEW YORK
JEFFERSON COUNTY

REVISED:
JANUARY 17, 1990

Federal Emergency Management Agency

COMMUNITY NUMBER - 360354

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Flood Insurance Study Effective Date: October 15, 1985

Flood Insurance Study Revised: August 4, 1987
January 17, 1990

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1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates a previous Flood Insurance Study/Flood Insurance Rate Map for the City of Watertown, Jefferson County, New York. This information will be used by the City of Watertown to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses in this study represent a revision of the original analyses prepared by the Buffalo District of the U. S. Army Corps of Engineers (COE) for the New York State Department of Environmental Conservation (NYSDEC), during the preparation of a Special Flood Hazard Evaluation Report. The work for the original study was completed in July 1985.

This revision was carried out to incorporate updated topographic and flooding information for the Black River. The work for this revision was completed in December 1988.

1.3 Coordination

On October 11, 1985, the City of Watertown was notified by FEMA of the initiation of a Flood Insurance Study for their community.

On September 11, 1986, the results of the study were reviewed at a final Consultation and Coordination Officer's (CCO) meeting attended by representatives of FEMA and the City of Watertown.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Watertown, Jefferson County, New York. The area of study is shown on the Vicinity Map (Figure 1).

Kelsey Creek and Cold Creek were studied by detailed methods for their entire lengths within the community. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through July 1990.

The Black River and Beaver Meadows were studied by approximate methods. In this revision, the zone of approximate study for the Black River was redelineated in the vicinity of the intersection of Factory Street and Mill Street in order to reflect updated mapping and flood data. This mapping included information concerning a retaining wall, and the flood data consisted of a recent report, prepared by the U. S. Geological Survey (USGS) concerning a 100-year flood that occurred in 1985 (References 1, 2 and 3). BeBee's Island was added to the maps in this revision. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the City of Watertown.

2.2 Community Description

The City of Watertown is located in the central portion of Jefferson County in northern New York State. It is bordered by the Town of Pamelia to the north and the Town of Watertown to the south, east, and west.

The City of Watertown is part of the Black River Basin. The climate of the Black River Basin is characterized by long, cold winters, and cool, short summers. Average annual snowfall in this area measures up to 120 inches (Reference 1).

2.3 Principal Flood Problems

Kelsey and Cold Creeks flooded in February 1985 causing damage to homes and businesses within the community. The flooding along both streams occurs because of their small channel capacities. The undersized culvert at the high railroad embankment near the mouth of Kelsey Creek also affects flood heights upstream from the railroad.

Flooding occurred along the Black River during the period of March 14-18, 1977. The flooding was the result of a deep snowpack, warm temperatures, and a large amount of rainfall. Floods occur almost every year when the spring thaw is combined with rainfall (Reference 4).

WATERTOWN
Carthage
Chaumont
Three Mile Bay
Sackets Harbor
Henderson Harbor
Adams
Rosiere
Dexter
Brownville
Watertown Int'l
Massena Int'l
Ogdensburg Int'l
Fort Drum
Fort Drum Gate
Fort Drum Gate
Fort Drum Gate

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 100-, and 500-year floods, have a 10, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The hydrologic analysis for this study was obtained from the COE publication: Special Flood Hazard Evaluation Report, Kelsey and Cold Creeks, City of Watertown, Town of Watertown, Town of Pamelia, Jefferson County, New York (Reference 5). A summary of the drainage area-peak discharge relationships for Kelsey and Cold Creeks is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
KELSEY CREEK					
At its confluence with the Black River	7.88	640	*	1,070	1,290
Immediately above left bank tributary approximately 645 feet upstream of Bradley Street	7.52	580	*	970	1,130

*Data not available

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
COLD CREEK					
Immediately above right bank tributary approximately 475 feet downstream of Hunt Street	3.11	320	*	585	820

*Data not available

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections for the backwater analysis of Kelsey and Cold Creeks were obtained from field surveys. Cross sections were taken at close intervals above and below bridges and culverts in order to compute the significant backwater effects of these structures.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1).

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 6). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for Kelsey Creek were determined using a 2-year water level of the Black River that could be expected once every two years. Critical depth was assumed for the starting water-surface elevation along Cold Creek.

Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the channels and floodplain areas. The channel "n" values for Kelsey Creek ranged from 0.040 to 0.080, and the overbank "n" values ranged from 0.050 to 0.100. For Cold Creek, the channel "n" values ranged from 0.040 to 0.090, and the overbank "n" values ranged from 0.050 to 0.100.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the Flood Insurance Rate Map (Exhibit 2); the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet and topographic maps taken from the COE Special Flood Hazard Evaluation Report at a scale of 1"=4,800 with a contour interval of 10 feet (References 7 and 8).

For the streams studied by approximate methods, the boundary of the 100-year flood was delineated using the updated mapping and the USGS report incorporated in this revision, the topographic maps referenced above, and the previously printed Flood Insurance Study for the City of Watertown (References 1, 2, 3, 7, 8, and 9).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the Flood Insurance Rate Map (Exhibit 2).

4.2 Floodways

The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

No floodways are shown within the City of Watertown since floodway information was not available.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies have been prepared for the Towns of Watertown and Pamelia (References 10 and 11). The results of this study are in complete agreement with the results of those studies.

Because it is based on more up-to-date analyses, this study supersedes the previously printed Flood Insurance Study for the City of Watertown (Reference 9).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Survey Map of the Land of Filtration Sciences, April 20, 1984.

2. City of Watertown, Community Map, 1986.

3. U. S. Department of the Interior, Geological Survey, Water-Resources Investigations 86-4191, Flooding of December 29, 1984 through January 2, 1985 in Northern New York State, with Flood Profiles of the Black and Salmon Rivers by Richard Lumia, Patricia M. Burke, and William H. Johnston, Washington, D. C., 1987.

4. U. S. Army Corps of Engineers, Buffalo District, prepared for the New York State Department of Environmental Conservation, Report of Flood, 14-18 March 1977, Black River Basin, New York, Buffalo, New York, November 1977.

5. U. S. Army Corps of Engineers, Buffalo District, prepared for the New York State Department of Environmental Conservation, Special Flood Hazard Evaluation Report, Kelsey and Cold Creeks, City of Watertown, Town of Watertown, Town of Pamelia, Jefferson County, New York, Buffalo, New York, July 1985.

6. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Generalized Computer Program, Davis, California, January 1981.

7. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 Feet: Watertown, New York, 1959, Photorevised 1982; Rutland Center, New York, 1959.

8. U. S. Army Corps of Engineers, Buffalo District, prepared for the New York State Department of Environmental Conservation, Special Flood Hazard Evaluation Report, Kelsey and Cold Creeks, City of Watertown, Town of Watertown, Town of Pamelia, Jefferson County, New York, Topographic Maps, Scale 1"=400', Contour Interval 10 Feet: Watertown, New York, July 1985.

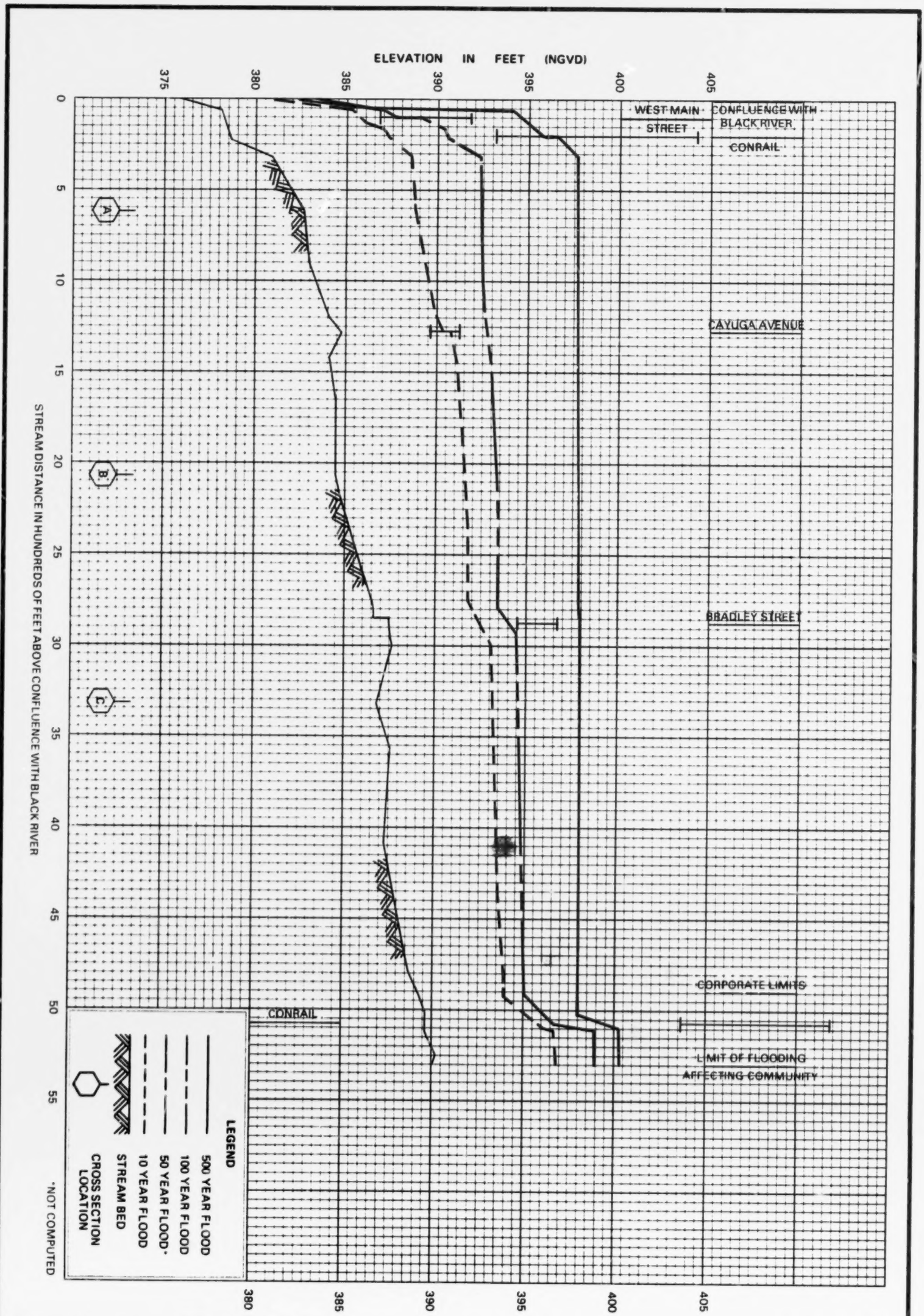
9. Federal Emergency Management Agency, Flood Insurance Study, City of Watertown, Jefferson County, New York, Washington, D. C., August 4, 1987.

10. Federal Emergency Management Agency, Flood Insurance Study, Town of Watertown, Jefferson County, New York, Washington, D. C., September 30, 1987.

11. Federal Emergency Management Agency, Flood Insurance Study, Town of Pamelia, Jefferson County, New York, Washington, D. C., January 6, 1988.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 1	01	389.63	Top of pier on southeast side of Cayuga Avenue bridge over Kelsey Creek.
RM 2	01	396.55	Top of sidewalk at base of concrete railing support on southwest corner of Bradley Street bridge over Kelsey Creek.
RM 3	02	509.17	Top of highway post, approximately 7 feet north of centerline of headwall of culvert at Hunt Street crossing over southeast Cold Creek.
RM 4	02	511.47	Top of northeast headwall of culvert of State Route 12 crossing over Cold Creek.



FEDERAL EMERGENCY MANAGEMENT AGENCY

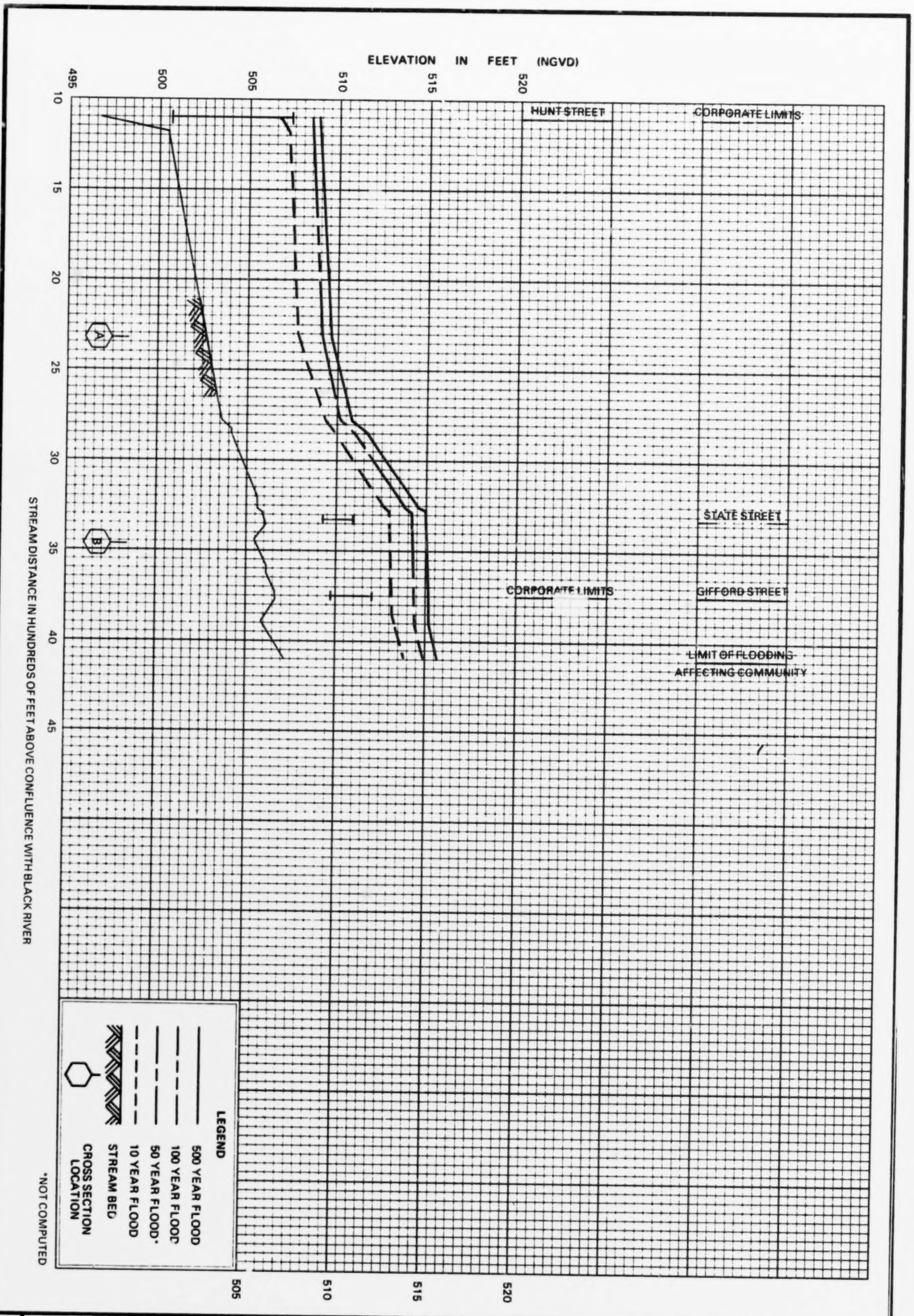
CITY OF WATERTOWN, NY

(JEFFERSON CO.)

FLOOD PROFILES

KELSEY CREEK

01P



13

02P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF WATERTOWN, NY

(JEFFERSON CO.)

FLOOD PROFILES

COLD CREEK